MINUTES OF THE MEETING OF
THE S-9 TECHNICAL ADVISORY COMMITTEE
FOR
PLANT GENETIC RESOURCES CONSERVATION AND UTILIZATION
S-9 MULTISTATE RESEARCH PROJECT

Cooperative among:
THE STATE AGRICULTURAL EXPERIMENT STATIONS
OF THE SOUTHERN REGION

the
AGRICULTURAL RESEARCH SERVICE

the
COOPERATIVE STATE RESEARCH, EDUCATION, AND
EXTENSION SERVICE

and the
NATURAL RESOURCES CONSERVATION SERVICE

of the
UNITED STATES DEPARTMENT OF AGRICULTURE

AUGUST 7-8, 2000

GEORGIA AGRICULTURAL EXPERIMENT STATION
GRIFFIN CAMPUS
GRIFFIN GEORGIA

SUBMITTED BY

DAVID COFFEY, CHAIRMAN

Adopted Agenda:

Monday - August 7, 2000

8:00 Call to order and opening remarks
Arkin, Lynch, Coffey

8:15 Status of PGRCU collection and seed storage/database management - Merrelyn Spinks

8:30 Presentations by staff (-15 minutes including discussion period for each)

Rob Dean
Bob Jarret
Roy Pittman
Gil Lovell

10:00 Break

Graves Gillaspie
Brad Morris

11:00 Leave for trip to Byron Georgia, field regeneration plots

12:15 Eat lunch in Byron

1:30 Tour regeneration plots

3:30 Leave for trip back to Griffin

7:00 Group dinner at Woodruff Pavilion

Tuesday - August 8, 2000

8:00 Budget picture - Bob Lynch

8:20 Comments from NSSL - Christina Walters
Reports from NPGS

8:50 Reports from S9 members of germplasm research in their states

10:00 Break

10:10 Committee representatives meet to formulate report

12:00 Meeting for TAC committee reps ends

Participants in The Meeting Information:

TAC Members:

David Coffey, Chair	TN - University of Tennessee
Jorge Mosjidis	AL - Auburn University
Kenneth Quesenberry	FL - University of Florida
Bill Rhodes	SC - Clemson University
Tom Stalker	NC - North Carolina State University
Charles Taliaferro	OK - Oklahoma State University
Jerry Arkin	Administrative Advisor to S-9 Technical Committee, Griffin, GA

PGRCU Staff:

Bob Lynch, Acting Research Leader
Lee Ann Chalkley, Seed Storage Manager
Rob Dean, Geneticist, Bioinformatics
Graves Gillaspie, Research Plant Pathologist & Vigna Curator
Rella Harrison, Administrative Secretary
Donnie Hice, Agricultural Research Assistant, Field Services
Mark Hopkins, Support Scientist, Molecular Genetics
Brad Morris, Agronomist & Annual Clovers & Special Purpose Legumes Curator
Melanie Newman, Research Coordinator, Peanuts
Roy Pittman, Agronomist & Peanut Curator
Brad Smith, Biological Science Tech, Wild Peanuts
Merrelyn Spinks, GRIN Coordinator & Computer Support
Jim Strickland, Farm Manager
Theresa Toborg, Agricultural Research Assistant, Grass & Misc. Crops

Other Attendees:

Darrell Cole, USDA, ARS, SAA, Acting Area Director
John Erpelding, Sorghum Curator, Mayaguez, PR
Christina Walters, Research Leader, National Seed Storage Lab, Ft. Collins, CO

1. Call to Order

The Regional S-9 Technical Advisory Committee (TAC) was called to order at 8:00 AM on Monday, August 7, 2000 by chairman David Coffey in the Redding building conference room on the Griffin Campus of the University of Georgia, College of Agriculture & Environmental Sciences, Griffin, Georgia.

2. Welcome And Opening Remarks

Jerry Arkin, in his welcome to the TAC and others, explained his role as the S9 Administrative

Advisor, and the S9 Project itself. The S-9 Project is the oldest project of this kind, being 51 years old, and is renewed every five years. Dr. Arkin expressed two main concerns. One is that the Research Leader position has not been filled. He voiced his concern about the extended period of time that has elapsed since the position has been vacant. He acknowledged Dr. Bob Lynch=s dedication as Acting RL for such a long period of time.

His second concern was about the budget. The Southern Directors met and approved salary increases plus $20,000 more in operating. The S-9 budget for FY 2001 will increase from $345,000 to $370,000. Even though state funds have increased, Dr. Arkin felt that it was not enough. He noted that other sites have received more federal funding. Another point Dr. Arkin noted about the program is that productivity has increased, while the Unit has been downsized. Due to the lack of additional funding, he voiced his concern about maintaining the quality and quantity of the program.

The USDA budget has continued to be flat. Peter Bretting has said that the Senate version of FY 2001 is $3 million, and the House version $1.8 million for ARS germplasm. The Agriculture Appropriations bill is now in conference. No locations were identified for these funds, although Dr. Arkin hopes something is in the budget for Griffin. A $500,000 budget increase for regeneration and viability studies is needed, with $200,000 more for a geneticist. The federal budget for Griffin is $1.5 million and $2 million is needed immediately. Also, extramural or outside funding would be beneficial.

Following Dr. Arkin=s remarks, and brief remarks by Drs. Cole and Lynch, there was a question and discussion period. Several questions focused on the search for the Research Leader, what scientific category was advertised, and if molecular research was emphasized. Nineteen applications have been received, and should be forwarded by ARS personnel to the selection committee within two weeks. The position will be a Category 4, Geneticist/Agronomist.

Regarding budget concerns, Dr. Cole suggested that the committee write a one page letter to the Agriculture committee chairman, Congressman Joe Skeen in the House, and Senator Cochran in the Senate in April and September. He expressed his appreciation of Dr. Arkin=s support and advice, and announced that Dr. Karl Narang will become South Atlantic Area Director in September.

Dr. Lynch expressed his thanks to Dr. Arkin for working with Congressman Mac Collins to obtain additional support. He gave his personal thanks to all personnel, and stated that he has enjoyed working with the staff.

3. Activities of the PGRCU

Merrelyn Spinks presented an overview of the PGRCU collection. A data sheet was distributed detailing the collection by crop groups. She also presented the activities of Field Services and Seed Storage/Database Management. (Appendix 1)

Gil Lovell, Grass Curator, was unable to attend due to illness. In his absence, the report was

presented by Merrelyn Spinks. More than 4,500 grass accessions have been backed up at the National Seed Storage Laboratory (NSSL) since last years meeting. The sorghum curator position at Mayaguez, PR has been filled by Dr. John Erpelding. There are concerns about the source of funding to cover the cost of regenerating Hibiscus accessions in a winter nursery at Tecoman, Mexico. More labor is needed to maintain the bamboo collection at Byron, Georgia. Other needs include the continuing use of St. Croix for APHIS-approved quarantine increase of sorghum and pearl millet, and viability testing of warm season grass accessions is critical for determining regeneration priorities. One of the more pressing needs is additional personnel assigned to Field Services so that regeneration of grass accessions and other crops that Mr. Lovell curates can be accelerated. (Appendix 2)

Mark Hopkins presented a summary of activities of the molecular genetics group. Seven SSR markers were used to screen peanut varieties to ascertain if the markers could distinguish between accessions. One peanut SSR was sequenced to determine if it could be used as a diagnostic tool in distinguishing between A and B genomes. A mini-core of botanical types of peanuts was screened using SDS PAGE, and 125 subterranean clover accessions were characterized using AFLP technology. More than 700 cDNAs were sequenced and edited for Dr. Robert Jarret. A genographer was developed to partially normalize peak height within and between gels. Current objectives highlighted were using SSR markers in peanuts to potentially separate by botanical type, determining the amount of genetic variation between and within peanut and sub-clover accessions, and completing the mapping of SSR peanut markers. Future objectives include assessing the peanut core collection for genetic diversity; developing a PCR marker for distinguishing between the A and B genomes in peanut; cloning cDNA libraries, sequencing, and establishing a database for major crop species in the S-9 collection; and AFLP analysis of variation in different *Vigna unguiculata* subspecies. (Appendix 3)

Roy Pittman, Peanut Curator, presented a summary of the status of the peanut collection. He outlined the cultivated peanuts by botanical grouping and showed several slides indicating country of origin of both cultivated and wild *Arachis* species. Assistance was provided by outside cooperators for increases in 1997 and 1998. Eighty-five percent of the peanuts are available for distribution and 93% are backed up at NSSL. Plans are to regenerate and characterize 1,000 accessions per year, although a possible request of more than 4,600 accessions of peanuts from ICRISAT will affect the amount of material needing regeneration. There are thirteen wild species not represented in the collection. Ten accessions per year will be regenerated of the wild species. If the screenhouse can be repaired, then between thirty and forty accessions could be grown at one time. A breakdown of the peanut budget was given with funding being the same as last year. Molecular research includes seed protein and allergen reactions to proteins, and an SSR study to detect variation within and between botanical varieties. Several cooperative projects were discussed. Projects to address include adequate facilities and personnel to handle the additional ICRISAT material, and wild peanut increases. (Appendix 4)

Graves Gillaspie, Vigna Curator, reviewed the status of the Vigna collection and pathology research, as well as service pathology work. Objectives are to curate the Vigna collection; and to detect, characterize, and eliminate pathogens through developing and applying new technologies. Regeneration of photoperiod-sensitive cowpea lines was discussed. IC-RT-PCR methods for

detection of peanut stripe and peanut mottle viruses have been developed. Needs include additional technical support and supplies for molecular work, support personnel for regeneration, and funding for seed viability studies. Research is continuing toward developing a PCR-based detection method for a potyvirus in peanuts in Brazil, identifying new viruses found in legume regeneration plots, and study of cowpea virus resistant lines. Service pathology work included testing of quarantine greenhouse peanuts for viruses, PStV testing of peanuts being distributed to foreign requestors, monitoring increase lines in the field and greenhouse, screening sweetpotato clones for viruses, and testing various legumes for six viruses. (Appendix 5)

Brad Morris, Clover and Special Purpose Legume Curator, reported that there are now more than 5,000 accessions comprising 424 legume species in his crops. Statistical data was given on the status of each crop; including availability, total backed up, core collections in clover, characterization data, and number regenerated. Curation objectives include work with ELISA Concanavalin A (Con A), molecular marker development, studies on legume-s effect on root-knot nematodes, and screening sub-clover for powdery mildew resistance. Accomplishments noted were that ELISA can quantify Con A, DNA has been extracted from 260 sub-clover accessions, AFLP markers plus morphological notes have been assembled for identifying redundancies, and that there was root-knot nematode gall reduction after treating with various legumes. Future goals consist of characterizing the sub-clover collection and developing cores for other legume crops. (Appendix 6)

4. Field Trip

A field trip was taken to Byron, Georgia to tour the field regeneration plots. Crops which are being regenerated or maintained at the Byron location include bamboo, peanuts, and various vegetable and legumes species. On the return to the main campus in Griffin; Vigna, legumes, warm season grasses, and miscellaneous genera were viewed in increase plots.

5. Call to Order

The Regional S-9 Technical Advisory Committee (TAC) was called to order at 8:00 AM on Tuesday, August 8, 2000 by chairman David Coffey in the Redding building conference room on the Griffin Campus of the University of Georgia, College of Agriculture & Environmental Sciences, Griffin, Georgia.

6. Budget

Bob Lynch, Acting Research Leader and Location Coordinator, gave an update on the status of the budget situation for the PGRCU. Total discretionary funding is continuing to decline with operating funds being inadequate. There has been no on-site germination data collected for the last ten years, and Dr. Lynch estimates that about 70% of the germplasm stored at PGRCU is greater than ten years old. He stated that there is $1.8 million in the House version and $3 million in the Senate version of the Agriculture Appropriations bill for the NPGS. No sites are specified or identified for increased funding. Representative Mac Collins, at the request of Dr. Jerry Arkin, has indicated that $300K of the proposed increase is for the PGRCU. An outline of the curator-s

standards for FY2000 was given, and a report covering the annual regeneration plans for January 2000 - December 2000 was distributed. It is estimated by Dr. Lynch that an increase in funding of about $750K would be needed to completely regenerate all germplasm at the PGRCU every ten years. (Appendix 7)

7. NSSL Report

Christina Walters, Research Leader at the National Seed Storage Laboratory, presented a report on the maintenance of sorghum germplasm. The report was based on data that she and the staff of PGRCU have cooperatively gathered and analyzed. Dr. Walters outlined three main issues: (1) Only 56% of sorghum accessions are stored at both NSSL and Griffin. About 13% of the Griffin collection is not backed up and about 30% of the NSSL collection is at that site only. (2) The second issue concerned the storage conditions at Griffin. Discussed were storage at 5C vs. -18C, comparison of aging rates at different temperatures, and seed moisture content. (3) The third issue was labor and space requirements of regeneration and moving seeds to -18C. Dr. Walters, after outlining the three main issues, then presented three alternative plans for setting priority for placing seeds at -18C. There was considerable discussion about which of the three plans would be most beneficial, or if there were other alternatives. Of special concern are the approximately 6,000 sorghum accessions not backed up at NSSL. It was noted that Dr. Rich Hannan, Western Regional Plant Introduction Station, has indicated he could grow 20 wild species sorghums at Pullman, Washington. Also, the Parlier location could grow from 20 to 50 accessions of sorghum, if they were photoperiod insensitive. (Appendix 8)

8. NPGS Report

A written report was submitted from the National Plant Germplasm System. (Appendix 9)

9. State Reports

Because of interest in continuing the discussion on the Unit budget, optimizing resources, and improving storage conditions, a resolution was made and passed to omit the TAC State Representative Reports. Written reports were submitted for inclusion in the minutes by Florida, North Carolina, Oklahoma, Puerto Rico, South Carolina, and Tennessee. A written report was also submitted by the National Center for Agricultural Utilization (NCAUR). (All reports included in Appendix 10)

10. Discussion

There was a lengthy discussion concerning how to get the most out of the PGRCU budget in order to get germplasm regenerated, evaluated, germination tested, and distributed. There was a great deal of debate about how to improve storage conditions to increase the time between regenerations. Following the presentation by Dr. Walters on sorghum, it was felt that sorghum could be used as a test case to develop a plan for making decisions about how best to proceed. The committee discussed such issues as frequency of use, freezer and cold storage facilities, germplasm age, storage capacity and needs, back-ups, regeneration, characterization of material,

and quality and quantity of accessions. Dr. Tom Stalker, North Carolina TAC representative, was designated by the committee to document the discussion and subsequently formulate a proposal based on his records. The proposal is to be circulated for comment before being added as part of the official minutes of the meeting. (Appendix 11)

11. New Business

A motion was made that if the possible $300K budget increase is received, that the additional funding would be used for operations with an emphasis on maintenance and regeneration, and that the funding increase would not be used for new scientist (SY) positions.

The lack of participation by some of the State TAC representatives was discussed. Dr. Arkin indicated he would bring this issue before the Southern Directors if he was provided a list of attendees for the last five years.

The committee voted to accept an invitation to participate in a joint meeting with the Plant Germplasm Operations Committee and all of the Regional Technical Committees at NSSL in Fort Collins, Colorado, June 26-28, 2001.

The new chairman of the S-9 TAC for the next year will be Dr. Kenneth Quesenberry, of the University of Florida.

Dr. Charles Taliaferro, Oklahoma State University, was nominated and accepted the position of in-coming chairman.

Some committee members felt that it might be beneficial to invite focus groups or select members from the private sector to participate at the 2002 meeting. The meeting will be held in Griffin with a field day and tour. Dr. Taliaferro, in his role as chairman, will coordinate this effort.

Chairman David Coffey adjourned the meeting at 12:00 noon.

Appendix 1

SEED STORAGE / DATABASE MANAGEMENT and FIELD SERVICES

SEED STORAGE / DATABASE MANAGEMENT

Lee Ann Chalkley
- Tiffany Bethune
- Verlene Byous
- Sylvia Jones
- Lebus Kilgore

Merrelyn Spinks

FIELD SERVICES

Jim Strickland
- Donnie Hice
- Jim Leaptrot
- Amos Mack
- Janet New

FIELD SERVICES ACCOMPLISHMENTS

Installed irrigation
- Pump (Griffin)
- Total system (Byron)

Built 50 pollination cages

Y2K

Winter storm

Drought

FIELD SERVICES NEEDS

Personnel

PGRCU (S-9) COLLECTION GENETIC DIVERSITY

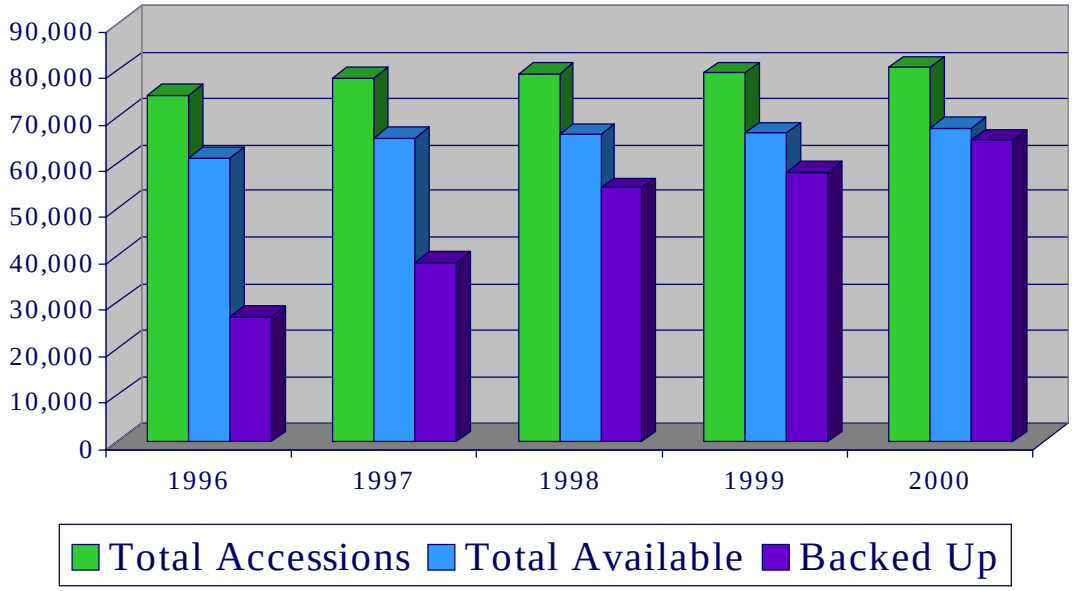
80,694 Accessions
124,912 Inventory Samples

265 Genera

1,475 Species

181 Countries

PGRCU (S-9) COLLECTION FIVE YEAR COMPARISON



SEED STORAGE / DATABASE MANAGEMENT

ACCOMPLISHMENTS

1,192 new accessions

6,938 backed up

Cleaning, weights, and counts

More than133,000 new observation records loaded
Castor, Clover, Cowpeas, Cucurbits, Eggplant, Okra, Peanuts, Peppers, Sesame, Sorghum, Special Purpose Legumes, Watermelon

More than 328,000 records added or modified on the GRIN

Bar coding

Y2K efforts & security

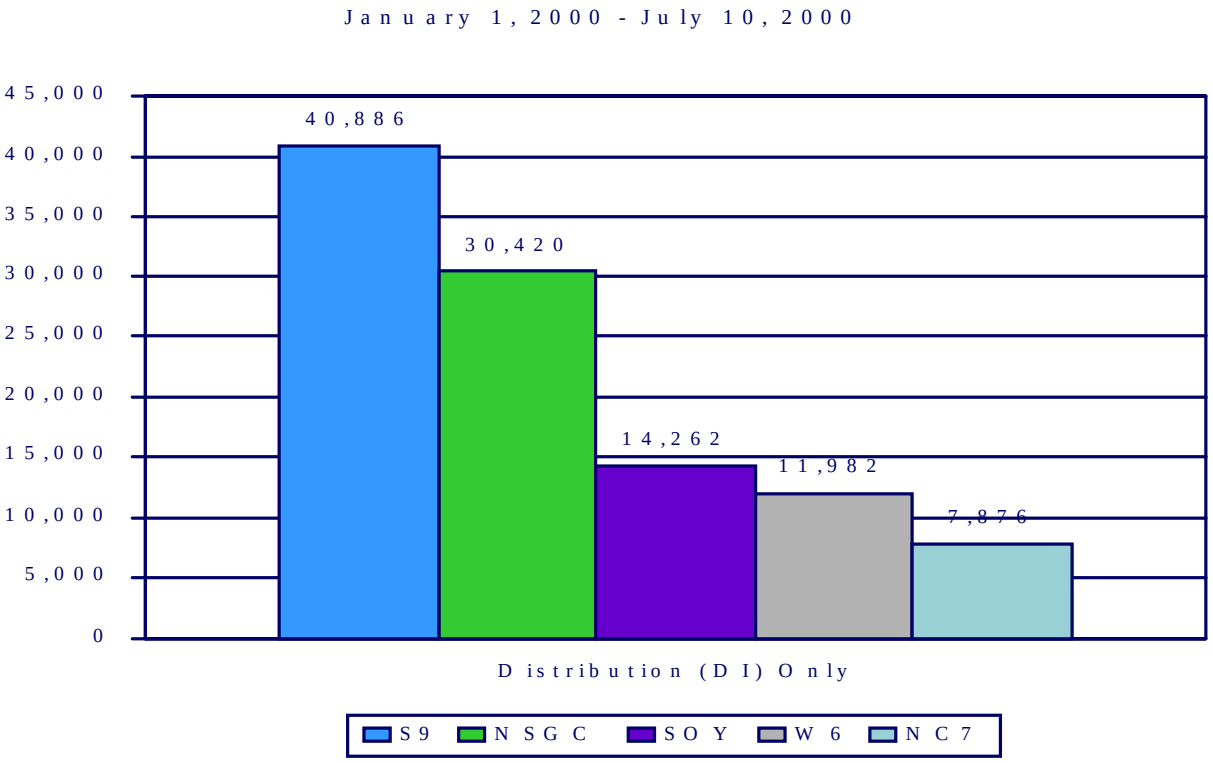
ORDERS

Orders (July 1, 1999 - June 30, 2000)
695 orders
53,932 items

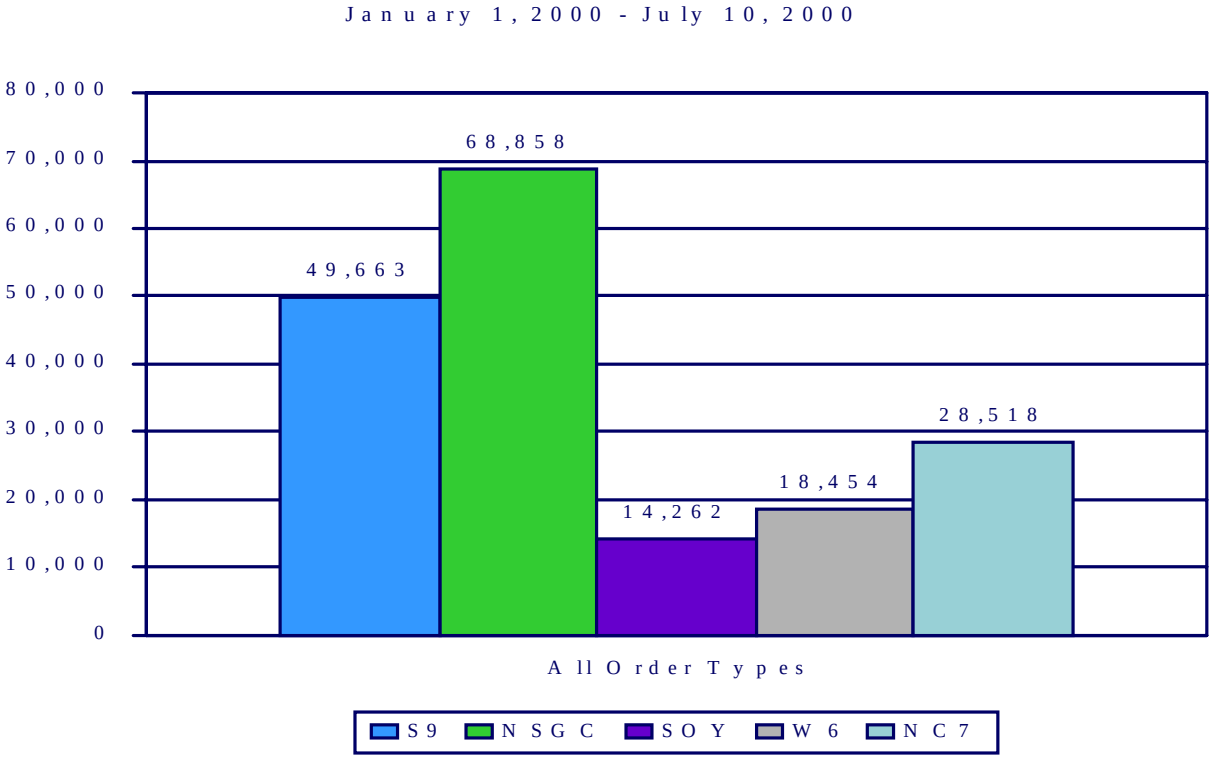
Foreign
119 orders (17%)
3,151 items (6%)

Domestic
576 orders (83%)
50,781 (94%)

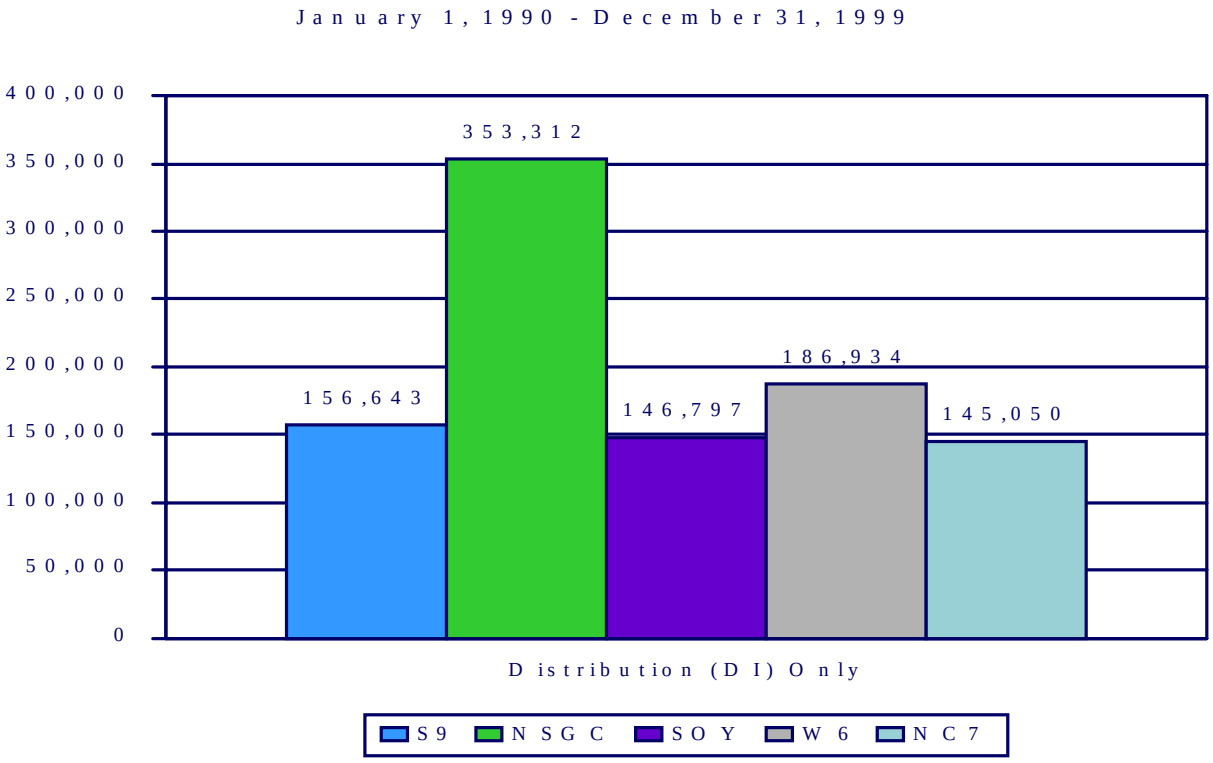
ORDERS (6 MONTHS)



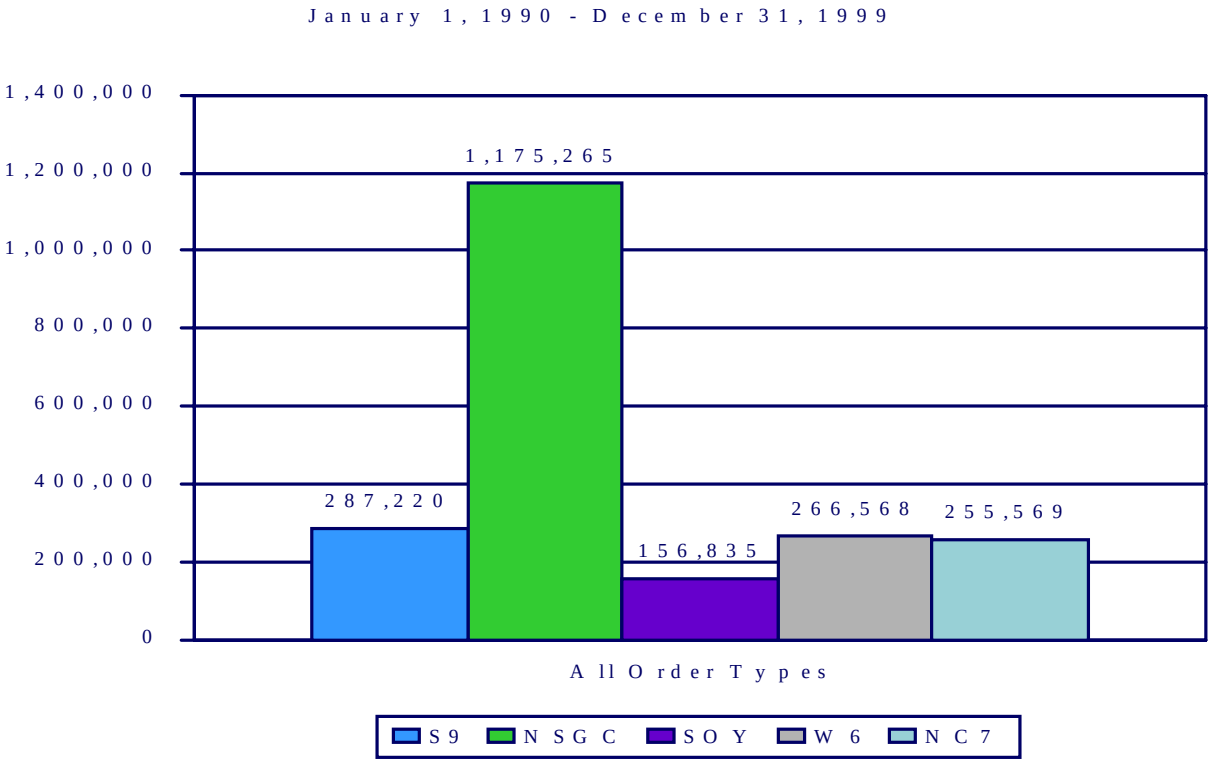
ORDERS (6 MONTHS)



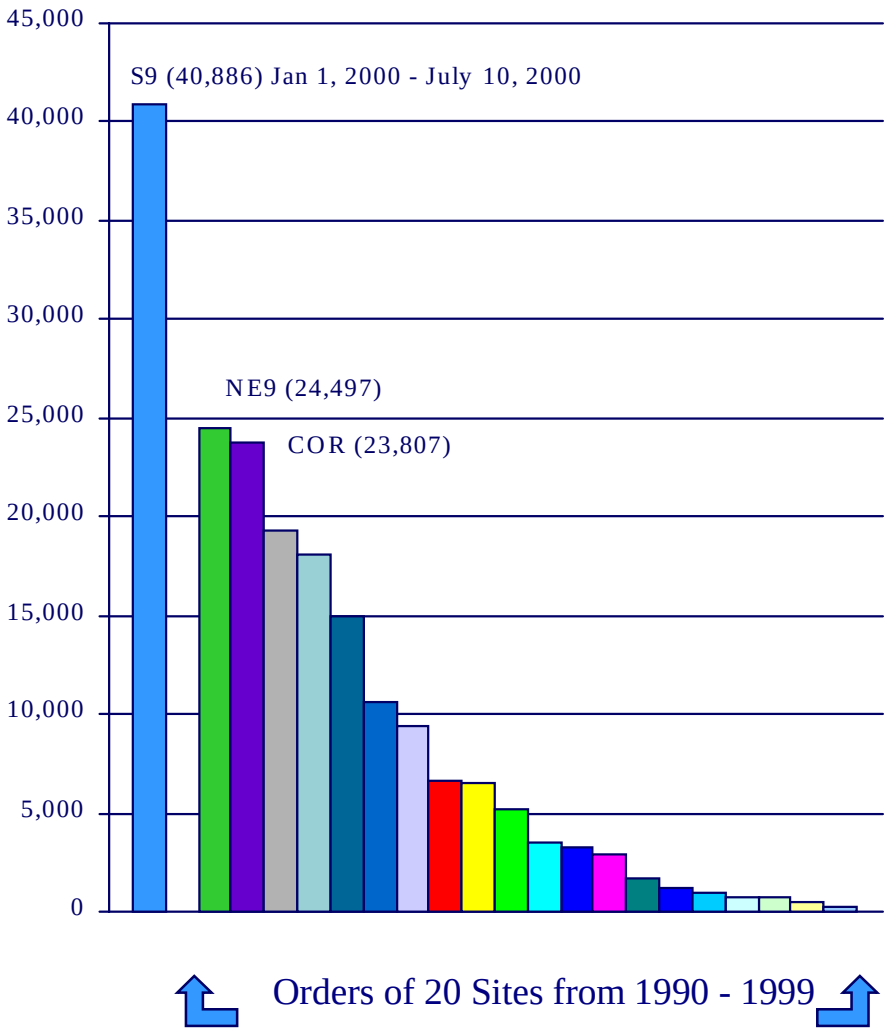
ORDERS (10 YEARS)



ORDERS (10 YEARS)



DISTRIBUTIONS FOR 21 NPGS SITES



Appendix 2

Grasses, Sorghum, and Miscellaneous Crops

PERSONNEL

Gil Lovell, Agronomist & Curator

Donnie Hice, Curatorial Support
Theresa Toborg, Curatorial Support

WARM SEASON GRASSES COLLECTION

- Total Accessions 6,815
  - Includes 548 clonals maintained in the greenhouse
- Number backed up at NSSL 5,869
- Number not available 933

GRASSES CURATORIAL ACTIVITIES

- Additional 4,513 accessions backed up at NSSL
  - More than 430% increase
- Completed detailed inventory
- Regeneration for 2000
  - 529 accessions
- Remaining unavailable
  - 404 accessions
- Leaves 5,000+ accessions
  - Over 10 years old

SORGHUM COLLECTION

- Total accessions 30,072
- Number backed up at NSSL 24,142
- Number not available 1,962
- Core collection 2,443

SORGHUM MAJOR CONCERNS

- Sorghum Curator position recently filled
  - Dr. John Erpelding
- Challenge of regeneration
  - 1,962 not available
  - 13,011 over 10 years old
- St. Croix, V.I.
  - Questionable status of continuing availability
  - Quarantine
    - Sorghum
    - Pearl Millet
  - Winter Nursery regenerations

MISCELLANEOUS CROPS

Bamboo, Castor, Hibiscus, Pearl Millet, Sesame, and Miscellaneous

PEARL MILLET

- Total accessions 1,081
- Number not backed up at NSSL 17
- Number not available 33
- Regeneration
  - High frequency of photoperiod responses

- Short-day, frost free conditions
  - St. Croix
  - TARS

HIBISCUS

- Regeneration
  - 91 accessions remaining
  - Winter nursery (Tecoman, Mexico)
  - Need $11,000 for costs

- Regeneration
  - $10,000 allocated annually to “operations” for Grass Curation (eight crops)
  - Currently $3,500 to $5,000 per year deducted from this for Hibiscus regeneration

BAMBOO

- 98 plots at Byron

- Need more labor (personnel) to properly maintain the collection
  - Sufficient labor not available the last three years

CASTOR, SESAME, AND MISCELLANEOUS

- Not available (all three crops) 138

- Not backed up (all three crops) 48

- Regeneration
  - 40 - 50 accessions per year for next 3 years

Needs

- Grass Collection
  - Most critical need - Personnel
  - Accelerate the rate of regeneration significantly (i.e. 600 - 1,000 accessions per year)
  - Requires an additional 3 FTE's per year assigned to Field Services

- Cost of first year for additional personnel to upgrade status of Grass Collection
  - Minimum of $63,000
  - Followed by projected cost increase of 3 - 5 % per year

- Access to winter nursery operations in a tropical area

- St. Croix needed for APHIS approved quarantine increase
  - Sorghum
  - Pearl Millet

- With corn also being grown at St. Croix, there isn't enough capacity for all our other needs

- Funding for contract services with the University of Puerto Rico or some other suitable tropical location

- Funding to provide for testing of grass accessions to determine seed viability (% germination)

- Knowing germination provides for better ranking of regeneration schedules

- Savings can be realized by avoiding regeneration

- Average cost per accession to regenerate is $140.00

- Cost of germ test is approximately $10 - 12 per accession

Appendix 3

PLANT GENETIC ANALYSIS

PERSONNEL

- Mark Hopkins (Support Scientist)
- Bobbie Bonner (Lab Assistant)
- Rob Dean (Research Coordinator II)

ACCOMPLISHMENTS

- Seven peanut SSR markers were used to screen varieties of peanuts to ascertain if the markers would be able to distinguish between accessions
- This pilot study was presented at the APRES meeting in July 2000
- Extensive sequencing of one peanut SSR marker to determine if it could be used as a diagnostic tool in distinguishing between the A and B genomes
- Screening a mini-core collection (Botanical types) for peanut genotypes using SDS PAGE
- In collaboration with Dr. Andy Paterson, mapping of peanut SSR markers in an interspecific hybrid tetraploid population
- Of the approximately 287 subterranean clover accessions, we characterized 125 with five individuals per accession using AFLP technology
- Sequenced and edited for Dr. Robert Jarret over 700 cDNAs
- Did the analysis for CIP on some AFLP potato data including interpretation of the data
- Worked with Dr. Tracie Jenkins on molecular characterization of termites
- Completed upgrades to both ABI sequencers
- Developed genographer to enable us to at least partially normalize peak height within and between gels

CURRENT OBJECTIVES

- ➤ Use the SSR markers in peanut to potentially separate accessions into botanical type
- ➤ Determine amount of genetic variation between and within peanut accessions
- ➤ Complete the mapping of SSR peanut markers
- ➤ Determine amount of genetic variation among, between, and within subterranean clover accessions

FUTURE OBJECTIVES

- ➤ Assess peanut core collection for genetic diversity
- ➤ Develop a PCR marker for distinguishing between the A and B genomes in peanut
- ➤ Clone cDNA libraries, sequence, and establish a database from major crop species in our collection
- ➤ Continue to explore new molecular technologies and marker systems for their utilization by plant curators
- ➤ AFLP analysis of variation in different *Vigna unguiculata* subspecies

Appendix 4

ARACHIS

9,403 Accessions
Representing 102 Countries

PERSONNEL

Roy Pittman, Curator

USDA Maintenance and Regeneration
Chris Jones, Cultivated Peanuts
Brad Smith, Wild Peanuts, Molecular and Field Testing

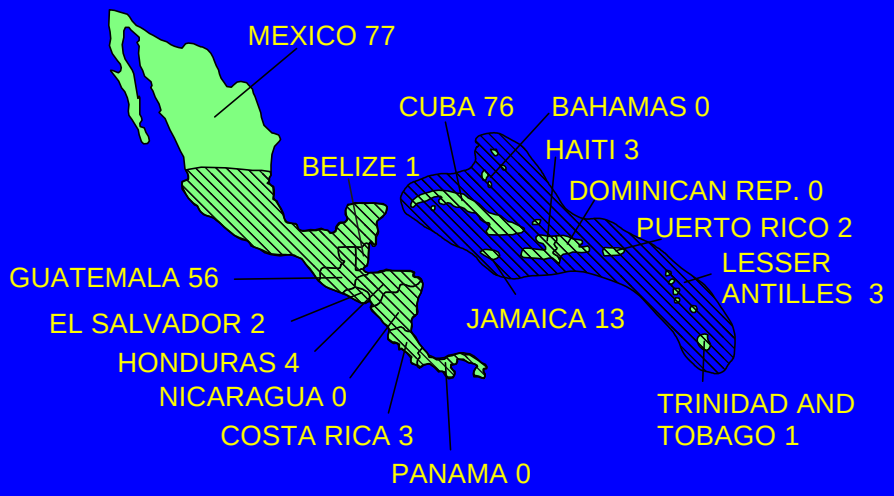
S-9 Molecular Bioinformatics
Melanie Newman, Molecular Characterization

Support from Field Services, Seed Storage, and Data Management

CULTIVATED PEANUTS BY BOTANICAL GROUPING AS OF 6/20/2000

Arachis hypogaea L.	6,697
Arachis hypogaea L. subsp. hypogaea	12
Arachis hypogaea L. subsp. hypogaea var. hypogaea	526
Arachis hypogaea L. subsp. hypogaea var. hirsuta J. Kohler	29
Arachis hypogaea L. subsp. fastigiata Waldron	176
Arachis hypogaea L. subsp. fastigiata Waldron var. fastigiata (Waldron) Krapov. & W.C. Greg.	1,139
Arachis hypogaea L. subsp. fastigiata Waldron var. vulgaris Harz	128
Arachis hypogaea L. subsp. fastigiata Waldron var. peruviana Krapov. & W.C. Greg.	24
Arachis hypogaea L. subsp. fastigiata Waldron var. aequatoriana Krapov. & W.C. Greg.	62

NPGS Accessions of *Arachis hypogaea* by Country of Origin *



* as of June 2000

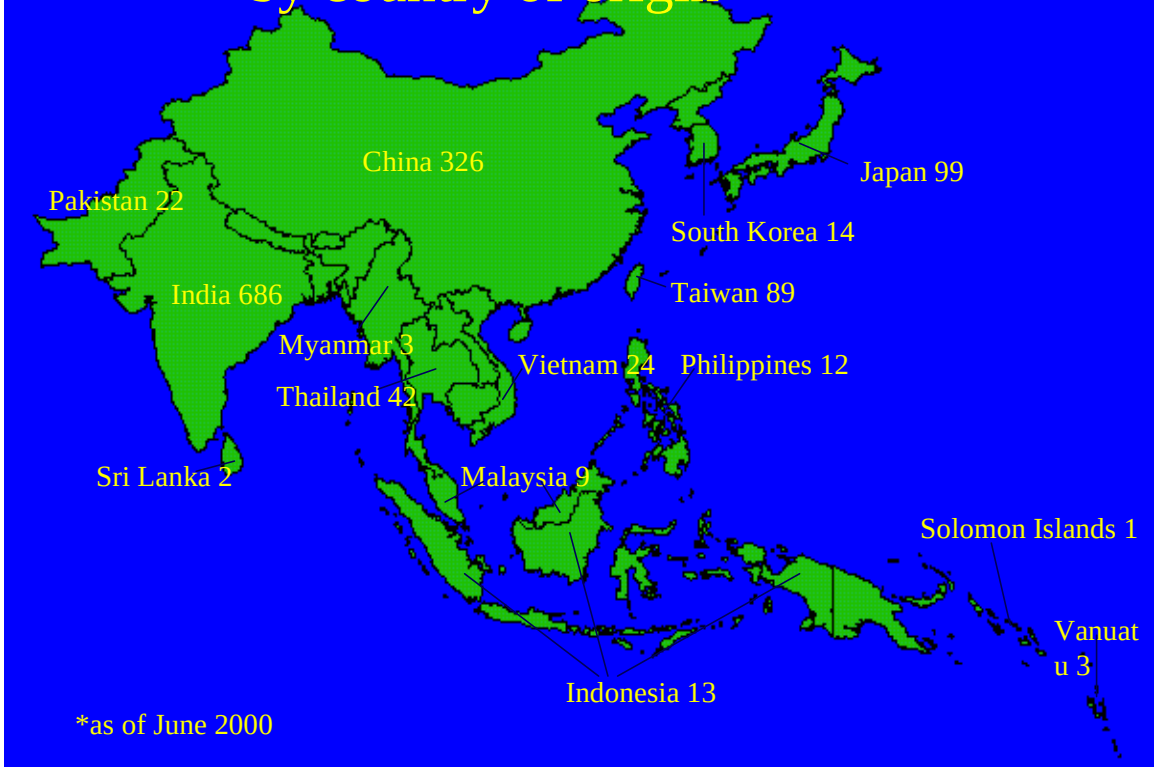
Prehistoric range of *Arachis hypogaea*

NPGS Accessions of *Arachis hypogaea* by Country of Origin *

* as of June 2000

Prehistoric range of *Arachis hypogaea*

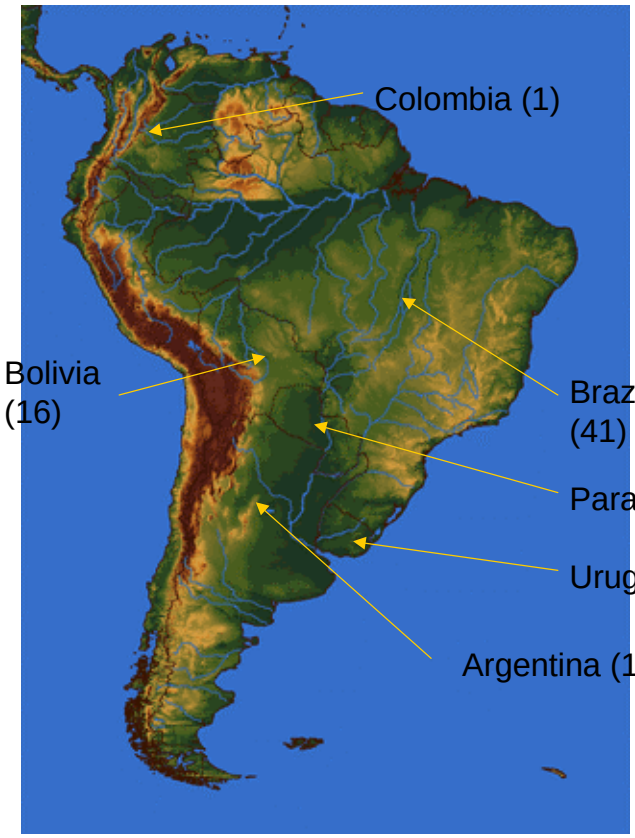
NPGS Accessions of *Arachis hypogaea* by country of origin*



*as of June 2000

NPGS Accessions of *Arachis hypogaea* by country of origin*

*as of June 2000

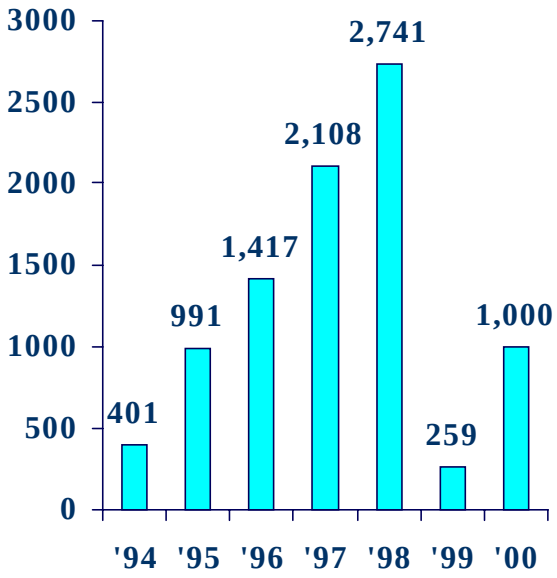


NPGS Species of Wild *Arachis* by Country of Origin*

* As of June 2000

INCREASES FOR CULTIVATED PEANUTS (1994-2000)

- 1997 - 4 cooperators
  - Holbrook, Kirby, Moore, and Gorbet
- 1998 - 5 cooperators
  - Holbrook, Kirby, Moore, Gorbet, and Isleib
- Year 2000 ?
  - ICRISAT Material



STATUS OF CULTIVATED GERMPLASM 2000

- 8,719 accessions in collection
- 7,404 available (85%)
- 710 minimal (8%)
- 1,315 not available (15%)
- 8,086 backed up (93%)
- 73 only at NSSL

CULTIVATED SEED INVENTORIES AT GRIFFIN

- 17 accessions have no harvest date
- 1,548 accessions are less than 3 years old
- 3,519 accessions are 3-5 years old
- 1,737 accessions are 5-10 years old
- 1,629 accessions are >10 years old
- 196 accessions are original seed only
- 73 accessions are listed as being increased

CULTIVATED REGENERATION PLAN (10 YEARS)

- There are plans to regenerate and characterize 1,000 accessions per year

- The ICRISAT request will affect the amount of material needing regeneration

WILD PEANUT SPECIES

- 13 species are not represented in the collection
- 13 species have 1-2 accessions
- 16 species have 3-4 accessions
- 7 species have 5-8 accessions
- 19 species have => 10 accessions

- 150 wild hybrids are in the collection

SEED INVENTORIES OF WILD PEANUTS

- 14 accessions have no harvest date
- 69 accessions are 3-5 years old
- 104 accessions are 5-10 years old
- 68 accessions are >10 years old
- 26 accessions are original seed only

- 4 accessions are listed as being increased

STATUS OF WILD GERMPLASM 2000

	Total	Number Available	Available Minimum	Not Available	At NSSL	At NSSL Only
Wild (Plants)	274	274	0	0	2	0
Wild (Seeds)	285	165	49	120	157	0
Wild (Plants & Seeds)	125	125	0	0	29	0

WILD REGENERATION PLAN (10 YEARS)

- 10 accessions per year are planned

- If the screenhouse is available then 30-40 could be grown
  - The screenhouse needs major repairs before use
  - Accessions will be grown in baskets for ease of harvest

PEANUT BUDGET

- USDA all other funds $20,000
  - General maintenance and evaluation
- S-9 funds after technical help $10,000
  - Molecular evaluation
- Georgia Peanut Commission $ 4,000
  - Identify new SSR markers

- Funding same as last year!

MOLECULAR RESEARCH

- Seed protein and allergens reactions to proteins

- Continue (repeat) SSR study to detect variation within and between botanical varieties of cultivated peanuts

COOPERATIVE PROJECTS

- Germplasm Evaluation
  - John Burke- Thermotolerance for growth and development
  - Keith Ingram- Photoperiod effects
  - Hassan Melouk- Multiple pests and disease resistance
  - Jim Todd- Multiple pests and disease resistance
- Molecular Projects
  - Andy Paterson- SSR mapping
  - Bert Abbott- ?
  - S-9 Laboratory- SSR discovery
- Peanut CRSP
  - Bolivia- New sources of disease and pest resistance

POSSIBLE GERMPLASM ADDITIONS

- Request of 4,629 accessions from ICRISAT

PROJECTS TO ADDRESS

- New Cultivated Peanuts from ICRISAT
  - Quarantine and Greenhouse Space
  - Field Space
  - Field Services Help
  - Seed Processing and Seed Storage
  - Data Processing
- Wild Peanut Increases
  - Use of Screenhouse

Appendix 5

PATHOLOGY AND *VIGNA* CURATION

PERSONNEL

Graves Gillaspie, Research Plant Pathologist & Curator

James Chalkley, Curatorial Support
Nancy Tingle, Curatorial Aide

Dave Pinnow, Pathology Services

OBJECTIVES

- Detection, characterization, and elimination of pathogens
  - Develop and apply new technologies
- Curate *Vigna* germplasm collection
  - Acquisition
  - Maintenance
  - Evaluation
  - Distribution
- Pathogen testing and therapeutic procedures to eliminate them

ACCOMPLISHMENTS

- Regenerated 51 photoperiod -sensitive cowpea lines

- Regeneration of 153 lines of cowpeas in the field/greenhouse at Griffin

- Six lines that had not produced seed in Georgia were grown in the field in Puerto Rico in the summer

- Compared regeneration of photoperiod-sensitive cowpeas at sites in Georgia, Puerto Rico, and St. Croix

- Development of IC-RT-PCR methods for detection of peanut stripe and peanut mottle viruses

NEEDS

- Technical support and supplies for molecular genetic analysis

- Support personnel for regeneration

- Seed viability studies

RESEARCH IN PROGRESS

- Development of a PCR-based detection method for a new potyvirus found in peanuts in Brazil

- Identification of new virus(es) found in legumes in regeneration plots

- Study of virus resistant lines of cowpeas in cooperation with a breeder at Charleston, SC

SERVICE PATHOLOGY ACTIVITIES

PEANUTS

- 233 P.I.'s in the quarantine greenhouse were tested for peanut viruses
- 472 seed samples for P.I.'s being sent out as seed orders were tested for PStV
- 500 P.I.'s grown for increase in Byron were monitored throughout the growing season

COWPEAS

- Greenhouse increase lines of winter 1999 were monitored by periodic testing and observation
- 388 samples from increase fields were tested for 8 seed-borne viruses and 418 samples from evaluation plots were tested for BlCMV and CMV

SWEETPOTATOES

- 56 clones went through the virus screening procedure in 1999

OTHER LEGUMES

- 134 samples of clover, *Crotalaria, Canavalia, Sesbania, Senna,* and other special-purpose legumes were tested for six viruses

VEGETABLES

- Various watermelon, okra, squash, sorghum, pepper, and castor bean field and greenhouse problems were diagnosed

RESEARCH SUPPORT

- Samples tested in support of research on an unknown virus in *Crotalaria*, work with PCV, and on a PCR-based test for PStV, PeMV and CABMV

Appendix 6

CLOVER AND SPECIAL-PURPOSE LEGUME CURATION/RESEARCH

PERSONNEL

Brad Morris, Curator

Clarence Lee, Curatorial Support

CURATION OBJECTIVES

CLOVER & SPECIAL PURPOSE LEGUME AVAILABILITY

Crop	Total Accessions	Number Available
Guar	412	407
SP Legumes	2,914	2,317
Trifolium	2,051	1,497
Winged Bean	164	8

CLOVER & SPECIAL PURPOSE LEGUME BACKED-UP

Crop	Total Accessions	Backed-Up
Guar	412	406
SP Legumes	2,914	2,291
Trifolium	2,051	1,434
Winged Bean	164	18

CLOVER & SPECIAL PURPOSE LEGUME CORE

Crop	Total Accessions	Core
Guar	412	
SP Legumes	2,914	
Trifolium	2,051	95
Winged Bean	164	

ANNUAL CLOVER & SPECIAL PURPOSE LEGUME AT NSSL ONLY

Crop	Total Accessions	NSSL Only
Guar	412	888
SP Legumes	2,914	86
Trifolium	2,051	24
Winged Bean	164	0

ANNUAL CLOVER & SPECIAL PURPOSE LEGUME CHARACTERIZATION DATA

Crop	Total Accessions	Observation Data Loaded
Guar	412	1,890
SP Legumes	2,914	5,600
Trifolium	2,051	9,393
Winged Bean	164	50

CURATORIAL ACCOMPLISHMENTS

- 24 crimson and arrowleaf clovers regenerated
- 19 self-pollinated clovers regenerated
- 10 Ethiopian clovers regenerated
- 84 self-pollinated special-purpose legumes regenerated and characterizations recorded

CURATION/RESEARCH OBJECTIVES

- ELISA Concanavalin A (Con A)
- Molecular marker development
- Evaluation of legume's effect on root-knot nematodes
- Screening subclover for powdery mildew resistance

CURATION/RESEARCH ACCOMPLISHMENTS

- ELISA can quantify Con A

MOLECULAR MARKER DISCOVERY

- Genomic DNA has been extracted from 260 subclover accessions
- AFLP markers plus morphological notes for identifying redundancies

DISCOVERY OF LEGUMES WITH NEMATICIDAL ACTIVITY

- Root-knot nematode gall reduction after treating with various legumes

SCREENING SUBCLOVER FOR POWDERY MILDEW RESISTANCE

- Resistance/tolerance identified

CURATION WORK IN PROGRESS

- 26 self-pollinated clovers transplanted and direct seeded at Byron and Griffin, GA
- 200 legumes regenerating at Byron, GA
- 24 wing bean accessions regenerating in the greenhouse
- 25 Lespedeza are regenerating at Griffin inside pollination cages with beehives
- 14 *Ornithopus* spp. have been regenerated at Griffin

CURATION/RESEARCH IN PROGRESS

- AFLP and morphological data used to identify redundant subclover accessions
- Legumes reduce nematodes
- Confirmation for ELISA Con A
- Complete subclover screening for powdery mildew resistance

FUTURE CURATION GOALS

- Characterization of the subclover collection
- NSSL back-ups for newly acquired accessions and needed regenerated material
- Development of cores for several important legumes

FUTURE CURATION/RESEARCH GOALS

- Discovery/development for molecular markers in legumes
- Value-added trait variability

Appendix 7

PLANT GENETIC RESOURCES CONSERVATION UNIT

ADMINISTRATIVE PERSONNEL

- Dr. Bob Lynch, Acting Research Leader/Location Coordinator

- Griffin Location
  - Rella Harrison, UGA Admin. Secretary
  - Bobbie Bonner, USDA Secretary

- Athens Location
  - Carolyn Toney, USDA Admin. Management Specialist
  - Genell Powers, Location Admin. Officer

PGRCU FUNDING

Conservation of plant germplasm collected throughout the world represents a gene bank for the improvement of agricultural crops grown around the world, and thus should be considered a national treasure.

SOURCES OF FUNDING

USDA - Agriculture Research Service

S-9- Southern State Agricultural Experiment Stations

ARS FUNDING

CRIS 6607-22000-004	-	$ 151,732
CRIS 6607-212000-007	-	$1,352,922
TOTAL ARS FUNDING	-	$1,504,645

ARS FUNDING – FIXED COSTS

IRC	-	$ 138,165
4% R&M	-	$ 60,186
Contract Services	-	$ 54,300
TOTAL		$ 252,651
SY Salaries	-	$ 549,675
Support Salaries	-	$ 536,900
RSA	-	$ 57,888
Promotions/Awards	-	$ 7,500
TOTAL		$1,151,963

ARS FUNDING

TOTAL FUNDING	$1,504,645
TOTAL FIXED	$1,404,614
Total Discretionary	$ 100,031

S-9 FUNDING

TOTAL FUNDING	$ 344,357
SALARIES	$ 312,953
DISCRETIONARY	$ 31,404

RESEARCH/CURATION

- Research Leader

- 5 Curators
    - 2 Category 1 - Gillaspie, Jarret
    - 3 Category 4 - Lovell, Morris, Pittman

- Support Scientists
    - 2 Category 3 - Hopkins, Pinnow

SUPPORT UNITS

- GRIN/Computer Services/Website Specialist
- Seed Storage and Distribution
- Farm Manager/Services
- Molecular Biology Laboratory
- Bioinformatics Manager/Geneticist

TOTAL DISCRETIONARY FUNDING

$131,435 Discretionary Funds
RL, 5 Curators, 2 Support Scientists,
5 Support Units

= $10,110/Unit

PLANT GENETIC RESOURCES CONSERVATION UNIT

We are still in the race, but keep falling further and further behind!

No germination data collected for the last 10 years!

Over 70 % of all germplasm stored at PGRCU is greater than 10 years old!

There is $1.8 million in the House version and $3 million in the Senate version of the Agriculture Appropriations Bill for NPGS, with no specific sites identified for increased funding.

Representative Mac Collins, at the request of Dr. Jerry Arkin, has indicated that $300K of the proposed increase is for the PGRCU!

As part of each curator's standards for FY2000, they were asked to develop a plan for germplasm curation that includes an annual assessment of the following:

(a) the number of lines maintained in the collection;

(b) the number of lines with adequate seed supply;

(c) the number of lines with minimal seed supply;

(e) the number of lines backed up at NSSL;

(f) the number of years that each line has been in storage at both Griffin and NSSL, i.e, 3 < years; 3-5 years, 5-10 years; > 10 years;

(g) a 10 year plan to regenerate all germplasm; and

(h) a detailed yearly plan for regeneration and characterization based on the previous data.

A conservative estimate of the support that would be required to completely regenerate all germplasm at PGRCU every 10 years and incorporate it into the collection would require a $750K increase in funding.

USDA-ARS BUDGET

Until then, we will just continue to shrink and “wish upon a star.”

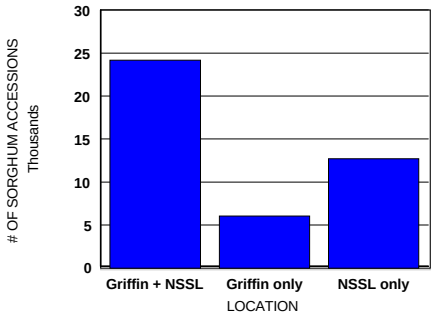
Appendix 8

NSSL REPORT

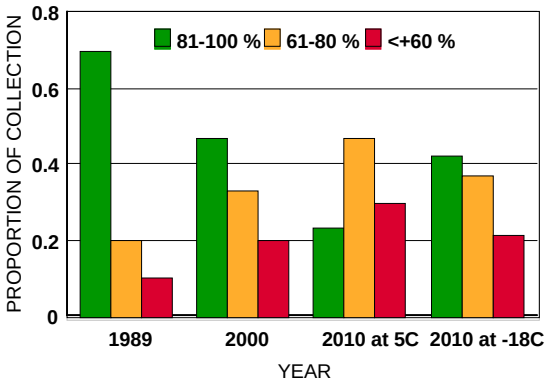
MAINTENANCE OF SORGHUM GERMPLASM
S-9 TAC
Aug 7-8, 2000

Issues:

1. Only 56% of the approx. 40K accessions are stored at both locations. About 13% of the Griffin collection is not backed up at NSSL and about 30% of the NSSL collection is at that site only.



2. Sorghum in the Griffin collection is stored at 5C. Storage at -18C would prolong seed lifespans. Aging rates range from 0.5 to 1% loss per year for seeds with germination % >60%. At -18C, aging rates are approximately 10x slower. The adjacent graph shows germination % of 465 accessions of sorghum measured in Griffin in 1989 and projected germinations after 10 years of storage at 5C (year 2000) and an additional 10 years at 5C or -18C (year 2000). About 40% of the sorghum collection has harvest dates > 10 yrs. Presuming aging rates above, we estimate about 2600 accessions are in need of regeneration today (500 are not backed up). In 10 years, the number of accessions requiring regeneraton will grow to about 6200 (1200 not backed up) if seeds remain at 5C. They will increase to 2800 (600 not backed up) if the storage temperature is reduced to -18C. The current seed moisture content (about 10%) is appropriate for -18C and does not need adjustment.



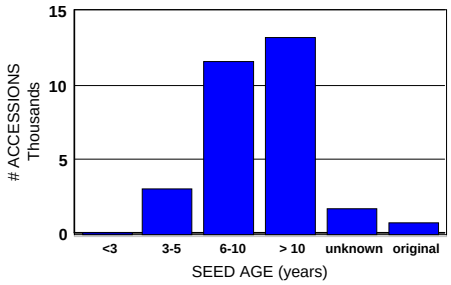
based on data from Bass&Stanwood, 19

3. Labor and Space requirements of regeneration and moving seeds to -18C preclude an easy solution. There is presently sufficient space for 15,000 accessions of sorghum in Freezer1 and additional temporary space in Coldroom 1 if it is converted to -18C. Thus, only 40% of the existing collection can be placed at -18C until more freezer space is available. Further, St. Croix work with the Mali Quarantine Collection precludes its help with regeneration of deteriorated samples.

Priority for placing seeds at -18C

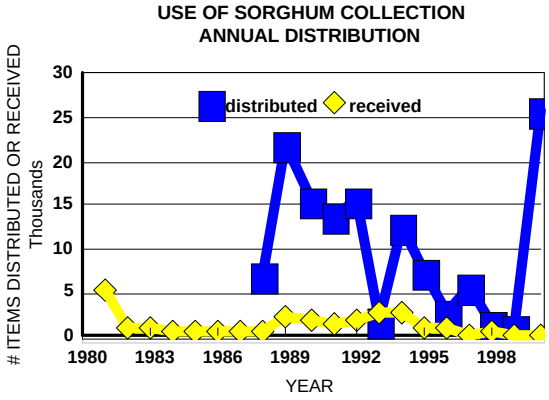
Plan A

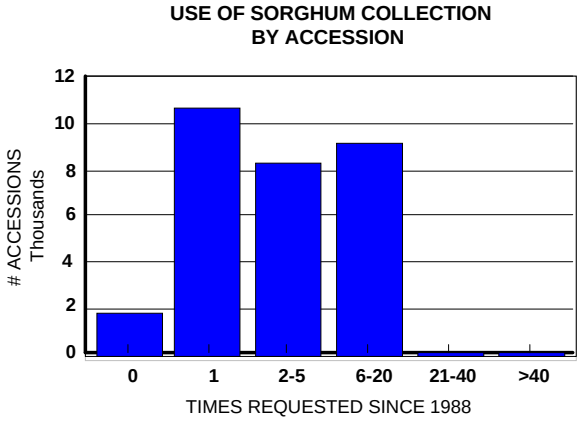
1. Seeds that are not currently backed up at NSSL	5928
2a. Accessions that are > 10 years old (13K - those in #1 above)	9654
Total	15582



Plan B

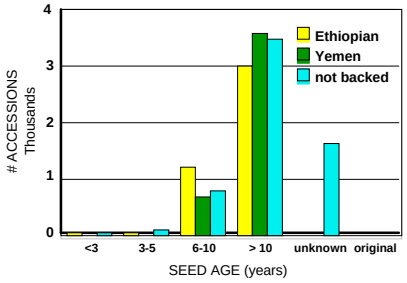
1. Seeds that are not currently backed up at NSSL	5928
2b. Seeds that are not distributed frequently (<=1)	10121
Total	16049





Plan C

1. Seeds that are not currently backed up at NSSL	5928
2. Core Collection	2443
3. Exotic germplasm	
Sorghum spp. (25 species, 146 not backed up)	545
Sorghum bicolor	
Sudan	2929
Ethiopian	5401
Mali	500
Eastern Africa	
West Africa	
Southern Africa	
Yemen (Middle East)	4306
India	
China	



Decision tree for testing and regenerating accessions

Is the accession backed up at NSSL? ---------YES----------> lower priority
5928 accessions

Is the accession less than 10 years old? ---------YES----------> lower priority
3472 accessions

Germination Assays at CSU (3000 in 2000-2001)

Is the Germination > 65%? ---------YES----------> lower priority

Is the accession a congener of S. bicolor ---------YES--------> regeneration of @20 accessions in glass house in Pullman in 2001

Is the accession photoperiod insensitive? ---------YES-------> regeneration of 20-50 accessions in Parlier in 2001

Appendix 9

2000 NATIONAL PROGRAM STAFF REPORT

FOR THE NATIONAL PLANT GERMPLASM SYSTEM
NATIONAL PROGRAM STAFF, NATIONAL PROGRAM 301: PLANT, MICROBIAL, AND INSECT GENETIC RESOURCES, GENOMICS, AND GENETIC IMPROVEMENT
(PETER BRETTING, DWAYNE BUXTON, EVERT BYINGTON, LELAND ELLIS, JOHN RADIN, JOHN STOMMEL; ADA JUDY ST. JOHN)

1 Personnel changes

1.1 Welcome to Jim Corfield, (Interim Director, Ohio Ornamental Germplasm Center); John Erplelding, sorghum curator at Mayaguez; Ted Kisha, genomics support at Pullman; Jennifer Crane, seed physiologist/support scientist and Christopher Richards, population geneticist, both at NSSL; Gary Kinard, plant pathologist at PGQO; Leland Ellis, NPL for Genomics; Evert Byington, NPL for Rangeland, Pasture, and Forage; Eric Rosenquist, NPL/Intemational Program Coordinator; Scott Cameron, who will assume the Horticulture and Sugar Crop NPL position (vice-Lawson) in late July. Thanks to John Stommel for acting so capably in the vice-Lawson position for more than a year. The vice-Murphy position, has not yet been filled, but we hope it will be within a few months. Steve King, database manager at the PGRU at Geneva, moved to PGQO to assume a similar position. Thanks to Bob Lynch, RL at the ARS location at Tifton, GA, for serving for almost two years as Acting RL at the Griffin, GA site. Congratulations to Joseph Postman at Corvallis for his reclassification and promotion, and to Ray Mock, who assumed Howard Waterworth's position at PGQO.

1.2 Farewell to Steve Eberhart, NSSL Director, who retired in March-congratulations to Henry Shands, who replaces Steve. Farewell to Phil Stanwood, NSSL, who retired on 30 June. Farewell also to Ahmed Hadidi and Howard Waterworth, who retired from PGQO early in 2000.

2 Site changes

2.1 Expansion continues at NPGS sites at high latitudes (e.g., Palmer, AK), low latitudes (e.g., Hilo, HI; Miami, FL), and those that deal with ornamentals. Additional funds were allocated in FY00 by Congress to the Ornamental Plant Germplasm Center at Ohio State University. Two OSU staff positions (Director and Curator) have been advertised.

2.2 The germplasm effort in Miami managed by Ray Schnell has benefitted from new funds for the genetic characterization of cacao. A new geneticist position has been established and advertised.

2.3 The germplasm effort in Hilo managed by Francis Zee is benefitting from new funds to develop the Pacific Basin Agricultural Research Center in Hawaii, and other U. S. Pacific flag territories. A headquarters and laboratory facility will be constructed, and new staff hired, in Hilo.

2.4 Based on the language in the Senate FY01 budgets, it is possible that the Arctic Germplasm Site, managed by Stoney Wright, Department of Natural Resources, State of Alaska, and Rich Hannan, Pullman, will receive a budget increase.

3 Budgets

3.1 As Appendix 2 (Excel spreadsheet) indicates, the budgets of many NPGS sites are strained at present. Continual increases in labor cost and the effects of inflation may further reduce the effective operating budgets in the future.

3.2 FY00. The ASTA effort to increase the NPGS budget by at least $20 million met with some initial success. $1.75 million was allocated for FY00 to genetic resource management at: Beltsville, $250K; Ames, $250K; Pullman, $250K; Albany, $250K; Columbia, $250K; Ithaca/Geneva, $250K; and Ft. Collins, $250K.

3.3 FY01. Again, the ASTA effort continues to be successful. The House version of the agriculture appropriations bill proposes a ca. $1.8 million increase, with allocations to 15 different sites, whereas the analogous Senate bill proposes a $3 million increase, with no specific sites identified. An increase of the magnitude proposed by the Senate, or, ideally, the $5.6 million proposed by the Administration, would have a strong positive impact on the NPGS. The ultimate decisions about the FY01 budget may not occur until late. summer or autumn.

3.4 FY02 and beyond? Federal budget surpluses are currently forecast for the next few years. The Social Security Trust Fund, at least for now, has been placed "off limits" as a source for balancing spending overruns. Nevertheless, spending cuts in the Federal budget might begin if the recent economic slowdown becomes a downturn. "Discretionary dollars" (includes USDA/ARS) might be squeezed particularly hard. FY01 will be the last budget administered by the current administration, because of Presidential and Congressional elections in November 2000. The political dynamics affecting NPGS funding might change dramatically then. Or, they may remain unchanged.

4 National Programs: During the last three years, ARS has reorganized its total research portfolio into a series of 23 national programs. Plant, microbial, and beneficial insect genetic resource management, genetic improvement, genomics, and genomic database management have been incorporated into National Program 301 (see the WWW at: http://www.nps.ars.usda.gov/programs/30ls2.htm).

4.1 On Apr. 3-5, 2000, this national program (which includes essentially all of the CRIS projects supporting the NPGS) held a National Program Workshop in Atlanta. More than 120 cooperators, customers and stakeholders from academia and the private sector attended, along with ARS scientists involved with NP 301. The goals of the workshop were to: 1) elicit input from our cooperators, customers and stakeholders about the priority agricultural problems that could be addressed by research and service projects in NP 301; 2) review the research and service currently conducted by NP 301; 3) identify strengths and deficiencies in NP 301, and suggest how NP 301 could be better focused on solving priority agricultural problems.

4.2 Following the workshop, three writing teams composed of ARS scientists began drafting an Action Plan to guide ARS scientists in choosing objectives for research projects under NP 301, beginning in 2001. The first draft of the plan is complete and is now undergoing editing.

4.3 Following completion of the action plan, the NP 301 CRIS projects will be subjected to mandatory peer review overseen by the USDA/ARS Office of Scientific Quality Review (OSQR). Details of this process are found at the web site http://osqr.ars.usda.jzov/panelpres This review is a response to Public Law 105-85 requiring that ARS projects be reviewed by panels composed primarily of non-ARS scientists.

4.4 The reviewers will examine the following aspects of ARS CRIS projects: 1) are the objectives appropriate for the NP with which the project is associated? 2) are the best scientific and technical approaches employed? 3) is attaining the objectives feasible?

4.5 The OSQR review of some NPGS CRIS projects may prove problematic, because of heavy emphasis on service/biological infrastructure, and the possible lack of a suitable corps of qualified reviewers (i.e., virtually all crop genebank managers in the U. S. are part of NPGS). Consequently, before the beginning of peer review in 2002, it may be prudent to develop the means for assessing NPGS's progress in attaining its objectives. As a point of departure, we are considering variables for measuring the status of germplasm collection that were suggested several years ago (see Appendix 1). Your input regarding this list would be most welcome. A different set of measures will be needed for NSSL, NGRL, PGQO, and CRISs that emphasize research.

5 Intellectual property rights issues continue to complicate germplasm management and exchange. Several NPGS sites are holding, or have been asked to maintain and distribute, germplasm protected by IPR of various types. We need a NPGS-wide policy or set of guidelines for germplasm with IPR. We plan to convene a committee to develop one.

6 Material transfer agreements (MTAs) now accompany probably most of the germplasm and biological research tools (e.g., reagents, probes) exchanged worldwide. At present, germplasm from the NPGS is not accompanied by MTAs, although the NPGS packing slip does request that recipients not seek IPR on the samples received, and communicates our desire for additional mutual germplasm exchange. Considering domestic and international developments in the areas of intellectual property rights (IPR) and the requirements of the Convention for Biological Diversity (CBD) for "prior informed consent," it is quite possible that, in the near future, all NPGS germplasm exchanges will be documented by MTAs, either paper or electronic. To prepare for such an eventuality, we plan to convene a committee to develop one.

7 International germplasm items:

7.1 At the kind invitation of Ken Richards, Manager of Plant Gene Resources Canada, PKB attended the 2000 meeting of the Expert Committee on Plant and Microbial Genetic Resources in Quebec in February. Not surprisingly, our Canadian

colleagues face many familiar challenges: identifying and removing duplicate accessions; deploying molecular marker analyses and core subsets; developing ways of optimally linking germplasm management and utilization with genomic analyses; international issues that complicate access to and exchange of germplasm; and actively monitoring the state of collections "at risk" due to changing curatorial status or institutional priorities. Canada's crop and "plant associated" microbial germplasm collections and germplasm management activities seem to be more closely coordinated than in the U. S. As in the U. S., a gamut of NGOs/seed saving organizations have evolved, and are generally supportive of Canada's governmental crop genebanks.

7.2 In May, Luis Antonio Barreto de Castro, Director of EMBRAPA/CENARGEN, Brazil's governmental germplasm and genomics agency, visited USDA/ARS headquarters. Based on his remarks, CENARGEN faces many of the same challenges as does the NPGS.

8 Related bioinformatics/genomics items and issues

8.1 Welcome to Leland Ellis, new NPL for Genomics, and part of the NP teams for both NP 10 1 (the "animal analogue" to NP 3 0 1), and NP 3 0 1. He has some experience with plant genomics through a project focused on Medicago truncatula.

8.2 The Arabidopsis genome will be declared "completely sequenced" probably sometime in late summer or the autumn. Data from Arabidopsis are, and will continue be, key to understanding plant genome structure and function. Most of the rice genome has already been sequenced, but the accessibility (i.e., what strings attached) of the data is in question. Medicago truncatula may be the next model plant proposed for "complete" genomic sequencing.

8.3 With the Arabidopsis sequencing project nearing completion, the plant genomics community is planning for the next "plant genomics megaproject." One proposal is the "Multinational Coordinated Arabidopsis 2010 Project: Functional Genomics and the Virtual Plant: A blueprint for understanding how plants are built and how to improve them" (http://www.arabidopsis.ora/workshopl.html). It proposes to determine the function of every Arabidopsis gene, and how gene expression is coordinated and regulated, by 2010.

Appendix 1: Suggested variables for measuring status of germplasm collections

1	"Farmgate" and/or strategic value (US and worldwide) for the crop
2	Genetic profiles, breeding and propagation systems for crop and related plants
3	Seed lists and catalogs available for crop-specific collection*
4	Total # of accessions of the crop held in the NPGS*
5	Total # accessions of the crop in the active collection
6	Total # and % accessions of the crop backed up at a second site
7	Total # and % of accessions of the crop at NSSL-only*
8	Total # of accessions available in the active collection, % of total*
9	# of germplasm orders annually, per crop and site*
10	# of seed packets and vegetative samples distributed annually, per crop and site*
11	# of accessions distributed annually, and % of total # of accessions, per crop and site*
12	# of customers served annually, per site or per CRIS project*
13	# of accessions backed up at NSSL during CY X, % of total active collection*
14	Mean # (standard deviation, min and max) of observations per accession in GRIN*
15	# and % of accessions with latitude and longitude data in GRIN*
16	# and % of accessions with secondary ID (race, variety) in GRIN*
17	# and % of accessions with provenance information in GRIN*
18	# and % of accessions or taxa with genetic profile data*
19	# and % of accessions acquired during CY X per crop and site*
20	# and % of accessions regenerated during CY X per crop and site*
21	# and % of accessions characterized during CY X per crop and site*
22	# and % of accessions evaluated during CY X per crop and site*

23 # and % of accessions with "recent" germination data (last 5? years) per crop and site

24 # and % of accessions for gerinination or viability during CY X per crop and site*

25 # and % of accessions (P. 1. ed) deactivated during CY X per crop and site*

26 # and % of accessions reidentified during CY X per crop and site*

27 # and % of accessions assigned PI numbers during CY X per crop and site*

28 # and % of accessions of seeds/propagules "stored" vs. "regenerated" or "established" during CY X per crop and site*

29 # and % of accessions of "wild-weedy crop relatives" in the major crop collection*

30 # and % of accessions in core subset(s) per crop and site*

31 # and % of accessions needing pathogen cleanup per crop and site (this may be unfeasible to measure?)

* = variables that might serve as performance indicators for peer review

Appendix 10

State Reports

Florida

North Carolina

Oklahoma

Puerto Rico

South Carolina

Tennessee

National Center for Agricultural Utilization (NCAUR)

FLORIDA

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Capsicum	**annum**	**20**	**12**	
	bacatum	**28**	**7**	
	chacoense	**1**	**2**	
	chinense	**12**	**19**	
	frutescens	**3**	**1**	
	sp	**2**	**20**	
Phyllostachys	**nigra**	**5**	**1**	
	aureosulcata	**1**		
	bambusoides	**5**		
	edulis	**2**		
	sulphurea	**4**		

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Phyllostachys	**vivax**	**2**		
Bambusa	**multiplex**	**3**		
Citrullus	**lanatus**		**4**	
Hibiscus	**cannabinus**	**2**		
Hibanobambusa	**tranquillans**	**1**		
Arundinaria	**pygmaea**	**2**		
Sinobambusa	**sp**	**1**		
Arachis	**hypogaea**			**5**
Trifolium	**pratense**			**9**
	incarnatum			**4**
Vicia	**sativa**			**4**

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Vicia	**villosa**			**2**
Luffa	**acutangula**		**1**	
	aegyptiaca		**1**	
Canavalia	**ensiformis**		**2**	
Mucuna	**pruriens**		**1**	
	sp		**1**	
Psophocarpus	**tetragonolobus**		**4**	
Ipomoea	**nil**			**7**
Cucurbita	**moschata**		**7**	
Vigna	**ungiculata**		**7**	
Solanum	**acerifolium**			**2**

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Solanum	**aculeatissimum**			**2**
	aethiopicum			**4**
	americanum			**4**
	anguivi			**2**
	astropurpurem			**2**
	aviculare			**4**
	capsicoides			**4**
	caripense			**2**
	elaeagnifolium			**2**
	ferox			**1**
	incanum			**4**

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Solanum	**laciniatum**			**4**
	linnaeanum			**4**
	macrocarpon			**2**
	mammosum			**4**
	melongena			**4**
	nigrum			**4**
	pseudocapsicum			**2**
	rostratum			**2**
	sessiliflorum			**2**
	sisymbriifolium			**4**
	spinosissimum			**2**

PLANT INTRODUCTION DISTRIBUTIONS TO FLORIDA

Crop		Private individual	Private Company	University or USDA
Solanum	**stramoniifolium**			**2**
	suaveolens			**4**
	virginianum			**2**
	lasiocarpum			**1**
Paspalum	**nicorae**			**21**
	notatum			**52**

SOME EXAMPLES OF P.I. USES

- Dr. Jay Scott Tomato Breeder UF/IFAS Bradenton, FL
  - PI 114490 excellent source of bacterial spot resistance to races T1 ,T2, T3.
  - Resistance to Gemini viruses from Tomato Genetics Stocks Collection numbers: LA1932, La1938, La2779

- Dr. Bruce Carle, Cucurbit Breeder UF/IFAS Apopka, FL
  - PI 296341 excellent source of Fusarium race 2 resistance.
  - Resistance to Fruit Blotch in PI 482279 and also 385964, 500303.
  - Resistance to viruses from recent introductions: PI 595200, 595201, 595202, 595203, and other earlier introductions.

- Dr. Ken Quesenbery, Forage Breeder UF/IFAS Gainesville, FL
  - PI 364388 of *Hemarthria altissima*, released in 1984 as 'Floralta'.
  - Now estimated to be grown on as much as 200,000 acres in central and south Florida.

- Dr. Gordon Prine, Forage Breeder UF/IFAS Gainesville, FL
  - PI 300086 still excellent for biomass energy
  - Ornamental perennial peanuts Arblick and Ecoturf in release process.

NORTH CAROLINA

North Carolina Report
S 9 Meeting, 2000, at Griffin, GA

Plant breeders and geneticists continue to use genetic resources from the national germplasm system. In addition to many new introductions, the *Nicotiana* collection is maintained in Raleigh as well as large numbers of accessions of peanut, oat, wheat, cotton, soybean, maize, cucumber, sweet potato, blueberry, strawberry, and several other horticultural crops. Interactions with the Southern Regional Plant Introduction Station are critical for the continued improvement of agronomic and horticultural crops in the state. Many wild relatives of the crops are also maintained as seed stocks or living collections.

Several cultivars have been released by breeders in the Crop Science Department at NCSU during the past year with exotic germplasm in their pedigrees, including **Perry**, a Virginia-type peanut with resistance to Cylindrocladium black rot; **N7001,** a soybean cultivar with resistance to mosaic virus, bacterial pustule, and frogeye leaf spot resistance; **NC 2000,** a line resistant to tobacco blue mold, **NC 100**, a cytoplasmic male-sterile F_1, fluecured tobacco hybrid with resistance to TMV, TEV, and PVY; **NC 297**, a high yielding black shank, nematode and TMV resistant tobacco cultivar; **Oxford 414NF,** a non-flowering flue-cured tobacco; **NC 606** a cultivar with high levels of both black shank and bacterial wilt resistance; **NC 72**, a cotton cultivar with excellent fiber properties and broad adaptability and excellent yield potential; and **NC-Frioflor,** an annual ryegrass forage. In the Horticultural Department, **Ruby Red,** a high-yielding sweet potato; five blueberry lines, including two highbush and three rabiteye types; three fruit peach varieties; and four ornamental peach varieties were released.

Breeding programs in both the Crop Science and Horticulture Departments are utilizing PIs for introducing disease and insect resistances into crop species. In addition, a sweet potato line with a high percentage of dry matter is being utilized for potential commercialization for ethanol production. Two species of *Arachis* were identified with high levels of resistance to tomato spotted wilt virus, an important disease throughout peanut production regions. Also, Dr. Robert Bird, an associate member of the Crop Science faculty, was sponsored by the USDA National Germplasm System on a collection trip to Mexico to obtain teosinte germplasm.

Researchers located in the Southern Region participated in a symposium sponsored by the Crop Science Society of America at their annual meetings in Salt Lake City in honor of Jack R. Harlan. He contributed more than 10,000 accessions to the national system, many of which are used in North Carolina and other Southern Regional states. In addition, last year several USDA scientists in the Department of Crop Science published a catalog of the origin, description and pedigrees of Chinese soybean cultivars released from 1923 to 1995.

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OKLAHOMA

S-009 RELATED GERMPLASM ACTIVITIES
OKLAHOMA
August 4, 2000

USDA-ARS LABS

Southern Plains Range Research Station, Woodward, OK. Ongoing research with eastern gamagrass, *Tripsacum dactyloides,* including genetic mechanisms and germplasm enhancement. Some germplasm enhancement effort with other native grasses, principally sand bluestem, *Andropogon gerardi* var. *paucipilus* and big bluestem, *Andropogon gerardi. C.* L. Dewald and others.

Grazinglands Research Laboratory, El Reno, OK. Substantial effort is underway in evaluating a range of cool-season grasses and legumes for adaptation/performance. Work now focuses on field evaluation of available cultivars and germplasm accessions. No current breeding/genetic enhancement effort. Steve Hamann and others.

South Central Agricultural Research Laboratory, Lane, OK. Continuing research with watermelon, *Citrullus* sp. including genetic mechanisms, germplasm screening and germplasm enhancement. Benny Bruton, Angela Davis and others.

Ongoing research with kenaf, *Hibiscus sp.* as a possible fiber/bioenergy crop. C. L. Webber and others.

OKLAHOMA AGRICULTURAL EXPERIMENT STATION

Continuing breeding and genetics research with bermudagrass, *Cynodon* sp., for forage, turf and conservation; and with switchgrass, *Panicum virgatum,* for bioenergy feedstock, forage and conservation use. Efforts include germplasm collection, evaluation and enhancement. C. M. Taliaferro and others.

Peanut breeding and genetics. Position currently vacant, in process of filling.

Continuing research with peppers and other vegetables encompassing germplasm evaluation. Jim Motes and others.

SAMUEL ROBERTS NOBLE FOUNDATION, ARDMORE, OK

A very comprehensive genetics/breeding effort underway with cool-season perennial grasses encompassing screening available germplasm for adaptation/performance. Andrew Hopkins and others.

PUERTO RICO

1999 Research Activities
Puerto Rico

Bryan Brunner
S9 Representative

A replicated guava planting consisting of 14 accessions was established at Juana Diaz in 1998, and maintained in 1999. Established orchards of guava (54 accessions), avocado (32 accessions) and soursop (7 accessions) were maintained at Juana Diaz. Seventeen plantain and 26 banana cultivars were maintained in a field germplasm collection at Corozal. In 1998 a replicated field experiment was established at Corozal to evaluate four plantain clones: 'Maricongo', FHIA 21, 'Hua Moa' and 'Dwarf French'. 'Hua Moa' shows more severe symptoms of yellow sigatoka *(Mycosphaerella musicola)* than the other clones, and FHIA 21 is the most tolerant cultivar. FHIA 21 shows the greatest susceptibility to banana streak virus of the plaintain clones evaluated. Field germplasm collections of yam (32 accessions), cassava (27 accessions) and sweet potato (15 accessions) were maintained at Corozal. Seventy-five tanier accessions were maintained in the field at Isabela. An evaluation of four yam cultivars, for enzyme activity and color changes during storage revealed that 'Binugas' and 'Kinabayo' showed less darkening during storage than 'Diamante' and 'Guinea Negro'. A germplasm collection consisting of 70 coffee accessions was maintained at Adjuntas. Evaluation of 'Orlando' tangelo on five rootstocks at Adjuntas and Corozal showed that the rootstocks 'Troyer', 'Cleopatra', 'Rangpur' and sweet orange produced more fruits per tree at Corozal than Adjuntas, while 'Naronja' rootstock produced more fruit at Adjuntas. The evaluation of two grapefruit cultivars on three rootstocks at Isabela showed that 'Swingle' and 'Sunki-Benecke' rootstocks produce more fruits per tree than 'Cleopatra'. However, fruit size was greater for 'Cleopatra'. The evaluation of 'Dancy', 'Washington Navel' and chironja on five rootstocks at Corozal and Isabela showed that 'Swingle' and 'Sunki-Benecke' rootstocks are the best yielders. A partial diallel series of crosses was accomplished in papaya and the resulting 21 F_1 hybrid combinations, the seven parental genotypes, and three commercial F_1 hybrids are being evaluated at Lajas and Isabela. Cucurbita germplasm was evaluated at Isabela, a collection of 34 Spanish lime accessions at Juana Diaz was evaluated for morphological and fruit quality characters for the second year, and field surveys to assess genetic variability and locate superior genotypes of Spanish lime were conducted.

Publications/Presentations:

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SOUTH CAROLINA

Watermelon Genes and Germplasm, 1976-1999

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INTRODUCTION

- Disease and insect resistance
- Male sterility
- Morphological traits
- Cucurbit Germplasm Cooperative watermelon gene lists/collections

DISEASE AND INSECT RESISTANCE

- With Grover Sowell
  - Gummy stem blight
  - Anthracnose
- With USDA Vegetable Lab (Frank Cuthbert, Perry Nugent)
  - Diabrotica resistance
- With Zhang
  - Fusarium wilt
  - Watermelon fruit blotch

MALE STERILITY

- Glabrous male sterile (Watts)
- Male steriles from China (Zhang and others)

MORPHOLOGICAL TRAITS

- Pale seedling markers
- Spotted
- Dwarf (Mohr)
- Entire leaf
- Tendrilless (Lin, Zhang)
- Orange-stripe (Zhang)
- Tomato seed and large edible seed (USDA, Zhang)

MOLECULAR MAPPING

- RAPDs (Zhang, Dane)

OTHER WORKERS IN SC: AMNON LEVI, TONY KEINATH

- USDA Vegetable Lab/CU Coastal REC (Claude Thomas)
- Genetic diversity among Citrullus using RAPD markers
- Disease resistance
  - Citrullus colocynthis - susceptible to GSB
  - Citrullus lanatus subsp. Citroides -resistant to GSB

NEW DIRECTIONS

- New Crops for a New Millennium
- Global Seed Issues and Initiatives

TENNESSEE

PLANT GENETIC RESOURCES CONSERVATION AND UTILIZATION

Report of Research
at
The University of Tennessee
for the
2000 Annual Meeting
of the
S-9 Technical Advisory Committee

Compiled
by
David L. Coffey

Aug 7-8, 2000
Griffin, Georgia

PRINCIPAL INVESTIGATOR: B. N. DUCK

Location: The University of Tennessee at Martin

Crop Species: Vetch (*Vicia spp*.)

Objectives: Evaluation of germplasm of *Vicia* for envirnonmental and agronomic adaptation potential for Northwest Tennessee.

Accomplishments/Ongoing Research: Over the past few years several accessions of *Vicia* distributed by the Southern Regional PI Station have been evaluated for their environmental and agronomic adaptation potential for Northwest Tennessee. The research leader on this project retired in early 1999 and at this time the future status of this project in unknown.

PRINCIPAL INVESTIGATOR: D. R. WEST

Location: The University of Tennessee at Knoxville

Crop Species: Corn *(Zea mays*)

Objectives: Germplasm enhancement

Accomplishments/Ongoing Research: From the University of Tennessee collection, seeds of twenty-nine selected lines of corn developed by Southern States that have discontinued corn breeding programs were submitted for storage to the North Central Regional PI Station and the National Seed Storage Laboratory. Yield trials of experimental hybrids developed from the Germplasm Enhancement of Maize (GEM) Project are being continued. Breeding and selection studies are underway to develop new lines from GEM populations that have been crossed to elite Tennessee germplasm.

PRINCIPAL INVESTIGATOR: B. V. CONGER

Location: The University of Tennessee at Knoxville

Crop Species: Orchardgrass (*Dactylis glomerata)*

Objectives: Germplasm development and cellular and molecular genetics of orchard grasses

Accomplishments/Ongoing Research: 'Embryogen-P', an orchardgrass genotype that has high capacity for regeneration through embryogenesis, was developed and is being maintained in the Department of Plant and Soil Sciences at the University of Tennessee. An advanced breeding line of orchardgrass (TN OG SYN-2) developed in this program has been tested for seed and forage yield by International Seeds, Inc. since 1996. It's performance has equaled or exceeded that of standard cultivars in several areas.

PRINCIPAL INVESTIGATOR: V. PANTALONE

Location: The University of Tennessee at Knoxville

Crop Species: Soybean (*Glycine max*)

Objectives: Use of molecular markers for indirect selection of agronomically important traits

Accomplishments/Ongoing Research: Ongoing research is to 1) identify quantitative trait loci (QTL) for the quantitative traits yield, plant height, protein concentration, oil concentration, seed size, and maturity, in an F_2 population from a cross between the soybean cultivars 'Essex' and 'Williams',and 2) analyze simple sequence repeat (SSR) markers which have significant QTLs in the F_2 population with field data from $F_{4:6}$ lines to identify whether early generation (F_2) molecular marker selection is effective and consistent with measured traits from more inbred ($F_{4:6}$) lines.

After DNA extraction, markers that were polymorphic between the parents were then analyzed against the F_2 and $F_{4:6}$ generation trait data. Additive and dominance genetic effects were partitioned by utilizing a general QTL model..

For the F_2 population, significant additive QTLs were maturity, height, yield, seed size, and oil. In the $F_{4:6}$ generation, significant additive QTLs were yield, protein, seed size and height.

PRINCIPAL INVESTIGATOR: V. PANTALONE

Location: The University of Tennessee at Knoxville

Crop Species: Soybean (*Glycine max*)

Objectives: Genetics of regulation of linolenic acid

Accomplishments/Ongoing Research: We have hybridized cultivated soybean with wild soybean plant *Glycine soja* (Sieb. and Zucc.) introductions. $F_{3:4}$ seed from the resultant *G. max x G. soja* populations exhibited a wide segregation pattern for linolenic acid (18:3) and seed mass. Oil concentration was positively correlated with seed mass. Evaluation of glycerolipid composition revealed that high 18:3 was not associated with an altered proportion of phospholipid and triacylglycerol among lines segregating for seed mass. Seed from F_3 plants from these *G. max x G. soja* populations exhibited a wide segregation pattern for relative estimates of w-6 and w-3 desaturase activity. Based on frequency class distribution analysis, the data supported the concept that genetic regulation of 18:3 concentration in wild soybean genotypes was determined by alleles governing each desaturase which are different than the corresponding alleles found in *G. max*.

PRINCIPAL INVESTIGATOR: J. H. REYNOLDS

Location: The University of Tennessee at Knoxville

Crop Species: Forages -tall fescue (*Festuca arundinacea*) and switchgrass (*Scirpus americanus*)

Objectives: Forage quality evaluation

Accomplishments/Ongoing Research: Along with tall fescue, several cultivars and accessions of switchgrass are being evaluated at two locations in Tennessee for forage quality and potential for biomass production.

Biomass from two seasonal cuttings of switchgrass have resulted in considerable biomass production, but with forage material after curing generally containing too high a moisture content for successful bailing.

PRINCIPAL INVESTIGATOR: B. REDDICK

Location: The University of Tennessee at Knoxville

Crop Species: Pepper (*Capsicum* spp.)

Objectives: Disease resistance (viruses)

Accomplishments/Ongoing Research: Over 400 cultivars and accessions of C*apsicum* sp. are being screened for virus resistance to cucumber mosaic virus, potato virus Y, pepper mottle virus and tobacco etch virus. Selections and crosses are being made based on virus resistance, fruit quality and other agronomic traits. Several new sources of resistance have been found.

NATIONAL CENTER FOR AGRICULTURAL UTILIZATION (NCAUR)

PROGRESS REPORT FOR THE S-009 RTAC
May 1, 2000

New Crops Research Unit, NCAUR, MWA, ARS, USDA

Test plots of cuphea hybrids from Steve Knapp (Oregon State University) were successfully grown in two Central Illinois locations in 1999 under the guidance of Bliss Phillips. New elite variety plants will be tested in 2000. Seeds from the top 100 clones of jojoba were analyzed for several constituents for the third year of a three year study to correlate constituent quantity and structure with plant characteristics. A interlaboratory collaborative study was performed on simmondsin analysis for jojoba. Seeds from new breeding varieties of cuphea, lesquerella and genetically engineered crops were analyzed to guide breeding work. Samples of seeds of sufficient sample size, in the new crops seed collection were all transferred to the National Seed Storage Laboratory. Salicornia seed oil was evaluated for composition and potential. An agronomic study for milkweed was begun in the greenhouse. Michele Giovannini, greenhouse manager, found that cutting the main stem of a milkweed plant caused multiple stem regrowth in a few weeks. In 2000 a cooperative effort between B.F. Goodrich, NCAUR's New Crops, Rich Wilson (ARS, Raleigh, NC) and North Carolina soybean growers was begun to develop Cassia obtusifolia as an alternative crop in North Carolina. A new professorship of Agronomy at Western Illinois University to work two-thirds of the time on alternative crops for Illinois is being filled. The New Crops group at NCAUR will work closely with whoever fills this position. A Seeds for Kids program was started March 18, 2000 with FFA and 4H students from 10 counties in Illinois. Each student was given seeds for nine potential new crops for Illinois to grow out 3 ten foot rows. Pictures of the plants at different growth stages are available on the NC website for the students to check out - so they can tell the plants from the weeds.

STATUS OF SOME NEW INDUSTRIAL CROPS

New industrial crops that were not commercialized 10 years ago are now producing raw agricultural materials worth more than $30,000,000 and many times that in value-added finished products for the United States.

COMMERCIALIZED NEW CROPS

Meadowfoam - An adequate supply of stored seed and oil have led to little or no commercial planting of meadowfoam for 2000 harvest. Yields in 1999 were about 800 lbs/acre with a range of 500 to 1100 lbs/acre. Test plots have been made in Washington, Oregon, California, North Dakota and Virginia in 1999. Meadowfoam oil at $5.00 - 6.00/lb. is in 200-300 products and there are many new derivatives. Increased marketing and sales of meadowfoam oil are needed.

Crambe - 30,000 acres planted for 2000 harvest. The AgGrow Oils new oilseed processing plant in Carrington, ND is temporarily closed. CENEX HARVEST STATES has formed a 50/50 partnership, Oilseed Partners, with crambe growers to market crambe products. Oil is available

by contacting Dave Christofore at dchristo@cenexharveststates.com 651 306 6409. In addition to current market, new products from the oil and meal need to be developed.

Jojoba - About 2 million lbs of seed harvested in 1999 in the U.S. 3 million pounds is expected in 2000. Oil prices at $10-12/kg or $12 million in raw agricultural product and much more in value-added exports. Total world market is estimated at 1500 metric tons of oil. Major producers in 1999 are Argentina, United States, and Israel. Coproducts need to be developed.

Kenaf - Over 6,000 acres of kenaf were planted in 1999 in Texas, Mississippi and Missouri for a number of specialty fiber applications. Whole stalk prices are $37-45/ton; fiber prices are higher a ton depending on purity. New uses for core are coming on line. If a major paper company committed to 5-10% of their pulp from kenaf, kenaf would be commercially successful for the long term. Commitment to include kenaf as a percentage of paper purchased by any large volume end-user would spur market development.

Milkweed - Yields of fiber were 5 lbs/acre, down from the previous year's of 11 lbs/acre. Early summer hail damaged the crop and late summer unseasonably heavy rains caused fungal disease losses. A potentially effective herbicide was identified in test plots and additional tests are planned. Wild collection continues to be a reliable source to match demand. Wild harvest was completed in one-third the time normally allotted for this effort. Demand for comforters increased 8% and new markets for the fiber are nearing commercialization. Because the seedmeal and pod trash were shown to be very effective nematicides, cooperators are needed to test markets for a natural alternative to chemical nematicides. Developing cropping guidelines and coproducts such as milkweed oil are priority areas along with expansion of fiber markets.

NEW CROPS NOT YET COMMERCIALIZED

Lesquerella, Euphorbia lagascae, Cuphea, Vernonia - New self-pollinating lesquerella varieties have been developed as well as higher lesquerolic acid content varieties. Companies continued to request samples of the oil and the gum in 1999. Although there are number of products that can be made, an end-user who requires 300 to 500 tons per year of lesquerella oil or lesquerolic acid is necessary to develop a commercial crop. One to 4 liter samples of lesquerella oil, refined and crude, should be available in August, 2000 from 3,000 lbs of seed in reserve and 24,000 lbs expected to be harvested in June, 2000. Cuphea hybrids were successfully grown in Central Illinois in 1999. Midwest interest in cuphea is high as a third crop in the corn/soybean rotation to disrupt the corn rootworm cycle. Elite variety testing is planned for 2000 but there is no planting seed available for larger plot testing until 2001 or 2002. Vernonia oil is available from Ver-Tech, Inc., Plano, TX

Guayule - ARS (WRRC and USWCL) has received a grant from Yulex to produce sufficient quantities of guayule for use in fabricating medical products for testing purposes. The information derived in obtaining the latex will help in developing the commercial-scale extraction facility.

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Appendix 11

PROPOSAL OF S-9
TECHNICAL ADVISORY COMMITTEE

Prepared by
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The National Germplasm System has maintained the plant genetic resources of the United States for more than a century. Since a *Brassica oleraceae* accession was registered with a plant inventory number in 1898, more than 600,000 entries have been entered into the GRIN system. Today there are more than 450,000 accessions maintained by the USDA both at regional sites for distribution and evaluation and at the National Seed Storage Laboratory for long-term storage.

The Southern Regional Plant Introduction Station at Griffin, GA maintains 22 crop collections, including a very diverse group of grass species and a Amiscellaneous@ collection. Currently, there are 80,694 accessions at Griffin, of which 65,115 (80.7%) are backed up at the National Seed Storage Laboratory. Although the three smallest collections each have fewer than 200 accessions, several large collections also exist at the station, including peanut (9,400), *Vigna* (12,852), and sorghum (30,072). The preservation of crop genetic resources is not a trivial exercise because of the vast numbers of entries to be propagated as well as many crop collections containing wild and cultivated species, seed-bearing and vegetatively propagated accessions, photoperiod sensitive species, both self and cross pollinated species, sexual and asexual reproduction, and perennials and annuals. In addition to maintaining the basic collections, 53,932 items were distributed to the user community during the past year and more than 328,000 records were added or modified in the GRIN database system at the Griffin station.

A decreasing resource base has led to the situation where more than 70% of the accessions at Griffin have not been propagated for more than 10 years. Further, germination tests have not been conducted to determine seed viability and most entries have little or no evaluation data associated with them. During the 1999-2000 budget period, appropriated funds to manage the Station at Griffin came from both federal ($1,542,127) and state experiment station ($324,357) sources. A large percentage of the funds (74.56%) are now used for salaries, whereas only 9.63% ($179,657) were available for operations, including all plant propagation, maintenance, and seed production. Resources are no longer available to fund seed reproduction for more than a fraction of the plant accessions currently at this location.

To lessen the financial burden of seed maintenance while directing resources toward the most Acritical@ accessions, the S9 Technical Advisory Committee proposes the following for the sorghum collection:

Resolution: As of 2001, maintenance of the sorghum collection at the Southern Regional Experiment Station will be restricted to the following:

1) *Core collection (2,443 accessions)*
2) *Most-used accessions (9,000 accessions requested 6-20 times during the past 12 years)*
3) *Wild species (545 accessions)*
4) *Most critical accessions in terms of needing regeneration (5,928 at Griffin only)*

The remaining 12,156 sorghum accessions will only be maintained in long-term storage at the National Seed Storage Laboratory and without duplication at Griffin. This will greatly restrict availability for future evaluations and potential exploitation by the user community.

While it is recognized that the above resolution is a significant departure from current USDA policy, until a significant infusion of funds is added to the Griffin location, there simply is not funding to duplicate the collection both at the National Seed Storage Laboratory and at the Griffin station. The Technical Advisory Committee recognizes that risks are involved in not duplicating accessions, especially during seed transport. However, without a financial commitment from the USDA to adequately fund maintenance of the collection, the best course of action is to commit efforts to a smaller sample of critical materials.

Although this recommendation is restricted to sorghum for the coming year, similar recommendations will be made in the future for other crops if the base funding is not increased to a level whereby the genetic resources at Griffin can be adequately maintained.